

GKN Driveline International GmbH
Hauptstrasse 130
53797 Lohmar

22nd September 2004
Oy/-- (20040464)
Q04052W000

BEST AVAILABLE COPY

**Longitudinal plunging unit permitting axial positioning
of the cage**

Claims

1. A longitudinal plunging unit for the transmission of torque in a drive assembly, comprising
a profiled sleeve (21) with circumferentially distributed, longitudinally extending first ball grooves (22);
a profiled journal (11) with circumferentially distributed, longitudinally extending second ball grooves (12);
balls (31) which are arranged in groups of pairs of first and second ball grooves (12, 22);
a ball cage (41) which is arranged between the profiled sleeve (21) and the profiled journal (11) and fixes the balls (31) in their positions relative to one another;
and
spring means which are supported on at least one axial stop (42, 43) and designed in such a way that, in an unloaded condition, the ball cage (42) is held at a distance from the at least one axial stop (42, 43).

2. A longitudinal plunging unit according to claim 1,

characterised in

that the spring means comprise a first spring (52) which is arranged between the ball cage (41) and the at least one axial stop (42, 43).

3. A longitudinal plunging unit according to claim 2,

characterised in

that the spring means comprise a second spring (53) which is arranged between the ball cage (41) and a second axial stop (42, 43), wherein the first axial stop and the second axial stop are arranged on opposed sides of the ball cage (41).

4. A longitudinal plunging unit according to any one of claims 1 to 3,

characterised in

that at least one of the two first and second axial stops (42, 43) is associated with the profiled journal (11).

5. A longitudinal plunging unit according to any one of claims 1 to 4,

characterised in

that at least one of the two first and second axial stops (42, 43) is associated with the profiled sleeve (21).

6. A longitudinal plunging unit according to any one of claims 1 to 5,

characterised in

that the first axial stop (42) is associated with the profiled shaft (11) and that the second axial stop (43) is associated with the profiled sleeve (21).

7. A longitudinal plunging unit according to claim 6,

characterised in

that the axial stop (42) associated with the profiled journal (11) is arranged at an inner end (16) of the profiled journal (11) and that the axial stop (43) associated with the profiled sleeve (21) is arranged at an open end (23) of the sleeve (21).

8. A longitudinal plunging unit according to any one of claims 1 to 7,

characterised in

that the at least one axial stop (42, 43) is provided in the form of a securing ring which is axially fixed to the profiled sleeve (21) or to the profiled journal (11).

9. A longitudinal plunging unit according to any one of claims 1 to 8,

characterised in

that the at least one axial stop (42, 43) is provided in the form of a stop sleeve (44) which is axially supported relative to the profiled sleeve (21) or the profiled journal (11).

10. A longitudinal plunging unit according to any one of claims 3 to 9,

characterised in

that the first and the second spring (52, 53) are pre-tensioned.

11.A longitudinal plunging unit according to any one of claims 3 to 10,

characterised in

that the first and the second spring (52, 53) are of different lengths.

12.A longitudinal plunging unit according to any one of claims 2 to 11,

characterised in

that the first spring and/or the second spring is provided in the form of a helical spring.

13.A longitudinal plunging unit according to any one of claims 2 to 12,

characterised in

that the first spring and/or the second spring (52, 53) comprises a greatest outer diameter which is smaller than a smallest inner diameter of the profiled sleeve (21) in the region of the ball grooves (22).

14.A longitudinal plunging unit according to any one of claims 2 to 13,

characterised in

that the first spring and/or the second spring (52, 53) comprises a smallest inner diameter which is greater than a greatest outer diameter of the profiled journal (11) in the region of the ball grooves (12).

15.A longitudinal plunging unit according to any one of claims 2 to 14,

characterised in

that the first spring and/or the second spring (52, 53) is firmly connected to the ball cage (41).

16.A longitudinal plunging unit according to any one of claims 1 to 15,

characterised in

that a group of balls (31') positioned in a common radial plane comprises a greater diameter than the balls (31) of the remaining groups of balls (31).

17.A longitudinal plunging unit according to any one of claims 1 to 15,

characterised in

that at least one of the ball grooves (12') of one of the two displaceable parts, i. e. the profiled sleeve (21) or the profiled journal (11), is arranged outside the region of the regularly distributed remaining ball grooves (12), wherein the ball grooves (22) of the other one of the two displaceable parts (21) are regularly distributed across

the circumference.

BEST AVAILABLE COPY